AMENDMENTS TO THE SPECIFICATION

Please replace the Abstract of the Invention that was submitted as a Preliminary Amendment included with a petition to reply to a Notice to File Missing Parts and filed on April 3, 2001, with the following.

A method for dynamically inverting an Asymmetric Digital Subscriber Line (ADSL) system, which includes a central exchange equipment (CE) connected to a service provider network and a user equipment (UE) connected to a user workstation. ~~The CE transmits high-speed data from the service provider network to the user workstation, and receives medium-speed data from the user workstation. CE coding/decoding means translate the high-speed and medium-speed data. The UE transmits medium-speed data from the user workstation to the service provider network and receives high-speed data from the service provider network. UE coding/decoding means translates the medium-speed data and high-speed data. In response to an inverting request message from the UE, the CE codes mediums-speed data and decodes high-speed data. The CE transmits a first message to the UE authorizing reverse mode transmission. In response to the first message, the UE coding/decoding means are activated~~ The CE and UE are interconnected by a PSTN link. The CE includes an ADSL transceiver and a splitter coupled between the CE transceiver and the PSTN link. The splitter includes a low-pass filter for separating low frequency voice signals from high frequency ADSL signals transmitted from the UE. In accordance with the method of the invention, an invert request message encoded as a tone sequence is generated by the UE and transmitted to the CE over the PSTN link. The tone-encoded invert request is received through the CE splitter low-pass filter and is decoded utilizing a tone decoder communicatively coupled between the CE splitter low-pass filter and the CE transceiver.

Please replace the paragraph beginning on page 5, line 10 with the following.

A method and system for dynamically inverting an Asymmetric Digital Subscriber Line (ADSL) system are disclosed herein. The ADSL system includes a central exchange equipment (CE) connected to a service provider network and a user equipment (UE) connected to a user workstation. The CE and UE are interconnected by a PSTN link. The CE includes an input line for ~~transmitting~~ receiving high-speed data from the service provider network which is then transmitted to the user workstation via a PSTN link, and further includes an output line for ~~receiving~~ sending medium-speed data received from the user workstation to the service provider network. The CE further employs ~~CE~~ ADSL coding/decoding means for coding the high-speed data and decoding the medium-speed data. The UE includes an input line for ~~transmitting~~ receiving medium-speed data from the user workstation which is then transmitted to the service provider network via the PSTN link, and further includes an output line for ~~receiving~~ sending high-speed data received from the service provider network to the user workstation. The UE further includes ~~UE~~ ADSL coding/decoding means for coding the medium-speed data and decoding the high-speed data. In accordance with ~~the method of~~ the present invention, a low-frequency channel employing a tone generator is utilized to transmit an inverting request message ~~is transmitted~~ from the UE to the CE. ~~In response to the inverting request message,~~ which is decoded a low-frequency tone decoder means associated with the CE. Responsive to the decoded inverting request, the CE coding/decoding means are activated for coding medium-speed data on the CE input line and decoding high-speed data on the CE output line. ~~Next, a first acknowledgment message is transmitted from the CE to the UE informing the UE that transmission in reverse mode is authorized. In response to the first acknowledgment message, the UE coding/decoding means are activated. Finally, a second acknowledgment message is transmitted from the UE to the CE informing the CE that switching into reverse mode is completed.~~

Please replace the paragraph beginning on page 7, line 14 with the following.

Figures 2A and **2B** illustrate, respectively, a block diagram of a conventional ADSL system including the central exchange equipment, and a block diagram of ~~the same~~ an ADSL

system ~~which has been switched into the~~ incorporating reverse mode switching features in accordance with a preferred embodiment of the present invention;

Please replace the paragraph beginning on page 7, line 21 with the following.

B4 **Figure 3** is a block diagram depicting an ADSL ~~transmission~~ transceiver unit incorporated within ADSL central exchange equipment or within ADSL user equipment in accordance with a preferred embodiment of the present invention;

Please replace the paragraph beginning on page 9, line 3 with the following.

With reference now to the figures wherein like reference numerals refer to like and corresponding parts throughout, and in particular with reference to **Figure 1**, there is depicted a B5 communication system **5** including a service provider WAN **10**, which may be the Internet network connected to a central exchange equipment (CE) **12** by means of an access node **14**. CE **12** includes an ADSL ~~Transmission~~ Transceiver Unit ATU-C **16** and a splitter **18**, which splits/merges the low bandwidth voice signals exchanged with a voice CX **20** with modulated data on a PSTN twisted pair **22**.

Please replace the paragraph beginning on page 9, line 15 with the following.

On the other side, the PSTN twisted pair **22** is also connected to a splitter **24** in a user B6 equipment (UE) **26**. Splitter **24** is connected to a telephone set (POTS) **28** to handle voice communications on the one hand, and to an ADSL ~~Transmission~~ Transceiver Unit ATU-R **30** on the other hand. ATU-R **30** is connected to a workstation **32** in the depicted embodiment but could also be attached to a LAN such as the Ethernet network.

Please replace the paragraph beginning on page 9, line 24 with the following.

Referring to **Figure 2A**, there is illustrated a block diagram of a conventional ADSL system including ~~the central exchange equipment~~ CE **12** of **Figure 1**. According to the B7 configuration illustrated in **Figure 2A**, ~~central exchange equipment~~ CE **12** includes ATU-C **16** and splitter **18** (connected to voice central exchange CX) and is provided with an input line **34** for ~~inputting~~ receiving high-speed data in the range of several Mbits/s (e.g. 6 Mbits/s) from the access node (depicted in **Figure 1**), and an output line **36** for outputting medium-speed data in

the range of several hundred of kbits (e.g., 640 kbits/s) to the access node. Both input line **34** and output line **36** are connected to ATU-C **16**. On the other side of the ADSL system depicted in **Figure 2A**, user equipment UE **26** includes splitter **24** (connected to POTS **28**) and ATU-R **30** to which are connected an output line **38** for ~~receiving~~ delivering high-speed data received from CE **12** to a user workstation (depicted in **Figure 1** as workstation **32**), and further includes an input line **40** for ~~transmitting~~ receiving medium-speed data from the user workstation which is then delivered to CE **12** via PSTN link **22**.

Please replace the paragraph beginning on page 10, line 11 with the following.

Turning to **Figure 2B**, there is depicted ~~the~~ an ADSL system ~~of Figure 2A which has been switched into the~~ incorporating reverse mode switching features according to the ~~method of the~~ present invention. The ADSL system shown in **Figure 2B** includes a CE **11** coupled to a UE **15** over PSTN link **22**. In a preferred embodiment, each of splitters **18** and **24** ~~has~~ includes a request R line **42** and **44**, respectively, over which is forwarded a tone sequence of low frequency signals that is used by ATU-C **16** or ATU-R **30** for dynamically inverting the system. Assuming, for example, that a user wants to transmit high-speed data on input line **40'**, a tone sequence is generated by and forwarded ~~on line 40~~ from a tone generator (depicted in **Figure 3**) that is preferably included within splitter **24**. Upon detecting the tone sequence, splitters **24** and ~~splitter~~ **18** activate ~~their~~ respective invert request R lines **44** and **42**~~, respectively~~, wherein each of invert request lines **44** and **42** deliver decoded invert request transaction messages to ATU-Rc **30'** and ATU-Cr **16'**~~. At this time, and with reference to Figure 2B together with 2A~~, resulting, as explained in further detail with reference to **Figure 3**, in ~~ATU-C 16 becomes~~ ATU-Cr **16'** switching to inverted mode ~~ATU-Cr 16'~~ and ~~functions~~ functioning as an ATU-R with input line **34'** receiving medium-speed data that is coded as medium speed data within ATU-Cr **16'** and output line **36'** delivering high-speed data that has been decoded as high-speed data by ATU-Cr **16'**. ~~Similarly~~ Conversely, ATU-R **30** ~~becomes~~ switches to inverted mode ATU-Rc **30'** ~~and~~ that functions as an ATU-C~~. ATU-Rc 30' now has a~~ having ~~high-speed output~~ input line **40'** receiving high-speed data that is coded as high-speed data by inverted mode ATU-Rc **30'** and ~~a medium-speed~~ output line **38'** ~~while ATU-Cr 16' now has a medium-speed input line 34' and a high-speed output line 36'~~ delivering medium-speed data that has been decoded as medium speed data by inverted mode ATU-Rc **30'**.

Please replace the paragraph beginning on page 11, line 13 with the following.

With reference now to **Figure 3**, there is depicted a detailed block diagram of ADSL equipment including an ATU-Cr **46** and a splitter **48** in accordance with a preferred embodiment of the present invention. As illustrated in **Figure 3**, ATU-Cr **46** includes an input line **50** for inputting high-speed data and an output line **52** for outputting medium-speed data when operating in the default (i.e. non-inverted) mode. The ADSL equipment illustrated in **Figure 3** is ~~also utilized as~~ likewise representative of a corresponding end-user equipment, ~~wherein the ATU-Cr unit is replaced by~~ i.e., a ATU-Rc unit. It should be noted that many channels that are multiplexed together may be defined as inputs. This is the case, for example, when a full duplex low-speed channel is incorporated using a portion of the bandwidth from the high-speed downstream channel. As additional bandwidth becomes available, more channels are defined, and when the bandwidth is reduced, some channels are suppressed.

Please replace the paragraph beginning on page 12, line 13 with the following.

There are two ways to invert the system to facilitate transmission of high-speed data from the user workstation. First, and in a preferred embodiment, in response to receiving a CMD1 request from processing engine **58**, a tone generator **62**, which as depicted is coupled to a low pass filter **64** within splitter **48** in the user equipment, generates a tone sequence (low frequency signals) that is transmitted on the PSTN twisted pair via a low pass filter **64**. Low pass filter **64** serves principally to separate voice signals which are exchanged with a POTS **66**. When the tone sequence is received in the central exchange equipment, it is decoded by a tone decoder **68** that is also incorporated within the corresponding splitter **48**. Tone decoder **68** sends a R1 command to inform processing engine **58** of the invert request.

Please replace the paragraph beginning on page 13, line 5 with the following.

Upon arrival at the central exchange equipment from the PSTN twisted pair, digital data (including the control channel) is first received by high pass filter **70** before being decoded by coding/decoding unit **60** wherein it is decoded. The decoded data is supplied to demultiplexer **72** which extracts the control channel and delivers it to processing engine **58** over line R2. In response to processing engine **58** of the central exchange equipment receiving either command R1 from tone decoder **68**, or command R2 from demultiplexer **72**, processing engine **58** asserts

an ACT instruction which is a request for ~~activating~~ inverting the activation of coding/decoding unit **60**. Upon receiving the activation inversion instruction, coding/decoding unit **60** performs all necessary steps for processing the input data on line **50** as ~~high~~medium-speed data and the output data on line **52** as ~~medium~~high-speed data.

Please replace the paragraph beginning on page 13, line 22 with the following.

Upon setting the ACT line, processing engine **58** either sends a command CMD1 to tone generator **62** or sends a command CMD2 to be inserted in the control channel by multiplexer **54**. The command CMD1 is sent for transmitting a tone sequence over the PSTN twisted pair to the user equipment, while CMD2 is for transmitting medium-speed data over the PSTN twisted pair. In either case, the message being sent is an acknowledgment to the user equipment authorizing it to transmit high-speed data ~~on~~ from its ATU input line. It should be noted that the acknowledgement message may be replaced by the superframe itself. In such a case, a line SD to the processing engine of the user equipment is asserted when a medium-speed superframe is detected by demultiplexer **72** of the user equipment.